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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,128	05/14/2001	William Marritt	U 013455-8	9065

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EXAMINER

OH, TAYLOR V

ART UNIT

PAPER NUMBER

1625

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/855,128

Applicant(s)

MARRITT, WILLIAM

Examiner

Taylor Victor Oh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 13 is/are rejected.
- 7) ☒ Claim(s) 11 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 112

Claims 1-2,4, 7-8, and 12-13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for polyguluronic acid, polymannuronic acid, polygalacturonic acid as a polyuronic acid, does not reasonably provide enablement for all the polyuronic acids in the field of chemistry. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to all the polyuronic acids unrelated to the invention commensurate in scope with these claims. According to the specification, the examples of the polyuronic acids are described in the followings: polyguluronic acid, polymannuronic acid, polygalacturonic acid, not all the polyuronic acids are related to the current invention. Therefore, an appropriate correction is required.

Claim 8 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for acetic acid, propionic acid or a mixture of them, as a low molecular weight carboxylic acid, does not reasonably provide enablement for all the low molecular weight carboxylic acids in the field of chemistry. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to all the carboxylic acids unrelated to the current invention commensurate in scope with these claims. According to the specification, the examples of the carboxylic acids are described in the followings: acetic acid, propionic acid or a

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mixture of them, not all the low molecular weight carboxylic acids are related to the current invention. Therefore, an appropriate correction is required.

because the specification, while being enabling for methanol, ethanol, n-propanol, and isopropanol as a low molecular weight alcohol, does not reasonably provide enablement for all the low molecular weight alcohols in the field of chemistry. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to all the alcohols unrelated to the current invention commensurate in scope with these claims. According to the specification, the examples of the alcohols are described in the followings: methanol, ethanol, n-propanol, and isopropanol, not all the low molecular weight alcohols are related to the current invention. Therefore, an appropriate correction is required. Furthermore, there are “foreman factors or Wands factors” regarding unpredictability because polyuronic acids include heterocyclic acids and a diverse scope of acyclic acids. Moreover, as the molecular weight varies substantially, so does the physical characteristics; therefore, more than routine experimentation is involved. See In re Armbruster 185 USPQ 204 (CCPA 1985) and Angstadt et al. , 190 USPQ 152 (CCPA 1990).

Claims 1, 4-5, 8, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 4 and 5, the phrase "preferably" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

In claims 1 and 13, terms "predominantly" and "polyuronic acids" are written. However, they are vague and indefinite. The term "predominantly" does not explain how much the lithium salt or polyuronic acids are present in the solutions; another term "polyuronic acids" does not define the range of the average molecular weight polyuronic acids. An appropriate correction is required.

In claim 13, a phrase "if necessary" is written. However, they are vague and indefinite. The claim does not define the situation that when it is not necessary to remove insoluble iron products from the solution.

In claim 8, "an acid" and "the pH" are written. However, they are vague and indefinite. The claim does not define the type of the acid nor the range of pH. An appropriate correction is required.

Claim 8 recites the limitation "the pH" in the step 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haug et al (Acta Chemica Scandinavica, Vol. 23, p. 2955-2962 (1969)) in view of Smidsrod et al(Acta Chemica Scandinavica, vol. 19, p. 143- 152 (1965)).

Haug et al teaches the preparation of alginate from the a mixture containing mannuronic acid residues and guluronic acid residues in the following steps: hydrolysis, oxidative and reductive degradation, alkaline degradation, and fractional precipitation.

1. in the hydrolysis, alginate (0.5 % w/v) in citrate buffer (pH 3.8) was heated under reflux and then the mixture was cooled and neutralized with sodium bicarbonate;
2. in the oxidative and reductive degradation, aqueous alginate was mixed with ascorbic acid and hydrogen peroxide in order to conduct the process;
3. in alkaline degradation, the reaction mixture of alginate and

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tripotassium phosphate was inhibited in the presence of potassium borohydride; after heating, the mixture was cooled and neutralized with acetic acid;

4. In fractional precipitation, alginate degraded at pH 3.9 during the heating was precipitated (see page 2957, in the middle section).

However, the instant invention differs from the Haug et al that a polyuronic acid has an average degree of polymerization less than 20; a solution contains 5 wt % or more a lithium salt of polyuronic acid ; the use of ferrous salt and alcohol is involved in the process .

Concerning the average degree of polymerization being less than 20, the reference does indicate that the average degree of polymerization can be reduced to 90 (see page , 2955 , in the abstract). Furthermore, the limitation of a process with respect to ranges of pH, time , the average degree of polymerization, and temperature does not impart patentability to a process when such values are those which would be determined by one of ordinary skill in the art in achieving optimum operation of the process. The average degree of polymerization is well understood by those of ordinary skill in the art to be a result-effective variable, especially when attempting to control selectivity of a chemical process. Therefore, it would have been obvious to the skillful artisan in the art to have motivated to control selectivity of the process by choosing the

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claimed range of the average degree of polymerization by routine experimentation on the Haug et al average degree of polymerization.

With respect to the solution contained 5 wt % or more a lithium salt of polyuronic acid, the reference does teach 0.5 % w/v alginate as a starting material in the process. Furthermore, the limitation of a process with respect to ranges of pH, time, concentration, and temperature does not impart patentability to a process when such values are those which would be determined by one of ordinary skill in the art in achieving optimum operation of the process. Concentration is well understood by those of ordinary skill in the art to be a result-effective variable, especially when attempting to control selectivity of a chemical process. Therefore, it would have been obvious to the skillful artisan in the art to have motivated to control selectivity of the process by choosing the claimed concentration by routine experimentation on the Haug et al concentration. Concerning the lithium salt of polyuronic acid, it is obvious to form salts from known acids. In re Williams, 89 USPQ 396 (CCPA 1951).

Regarding the use of ferrous salt involved in the process, the reference is silent. They are well-known compounds such as hydrogen peroxide $\text{FeCl}_3 \cdot \text{H}_2\text{O}$ used as a degradation catalyst in the preparation of alginate as shown in the Smidsrod et al (Act Chemica Scandinavica, vol. 19, p. 146, in the middle section, (1965)). Therefore, it would have been obvious to the skillful artisan in the art to have motivated to use the Smidsrod et al hydrogen peroxide $\text{FeCl}_3 \cdot \text{H}_2\text{O}$ in the oxidative and reductive degradation

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reductive degradation as an alternative to Haug et al catalyst with an expectation of a similar success as shown in the Smidsrod et al reference.

Haug et al does teach the preparation of alginate from the a mixture containing mannuronic acid residues and guluronic acid residues in the following steps: hydrolysis, oxidative and reductive degradation, alkaline degradation, and fractional precipitation. And the Smidsrod et al expressly teach hydrogen peroxide $\text{FeCl}_3 \cdot \text{H}_2\text{O}$ used as a degradation catalyst in the preparation of alginate. Both references have been dealt with the same subjection matter of preparing alginate with a similar process. Therefore, it would have been obvious to the skillful artisan in the art to have motivated to use the Smidsrod et al hydrogen peroxide $\text{FeCl}_3 \cdot \text{H}_2\text{O}$ in the oxidative and reductive degradation as an alternative to Haug et al catalyst with an expectation of a similar success as shown in the Smidsrod et al reference because both teach the same utility.

Claims 11 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 703-305-0809. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alan Rotman can be reached on 703-308-4698. The fax phone numbers


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for the organization where this application or proceeding is assigned are 703-308-2742 for regular communications and 703-305-7401 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1235.



October 1, 2002



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